Using linux throughout the complete UAV stack

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ELC-E 2014, Dusseldorf

something about dronecode.org announcement

Basics of RC planes

Show http://www.stormthecastle.com/model-airplanes/basics-of-controls-of-an-rc-airplane.htm in browser

BACK TO THE RC Airplane Home Page

- Beginners Guide to RC Airplanes
- Beginners Guide to Gas Powered Airplanes
- How an engine is installed in a plane
- Testing and calibrating a gas powered plane
- The Megatech Night Flyer
- All the parts of an RC Airplane explained
- Basics of how an RC Airplane works (Roll Pitch and Yaw explained)
- A look at the hand held controller /transmitter
- Video Tutorials
- Links/Resources
- About RC plane engines
- About Flight Simulators
- Tips for building RC Airplanes
- RC Airplane terms, words and defintions
- How to get started in the Hobby of RC airplanes
- RC Timeline of Radio control

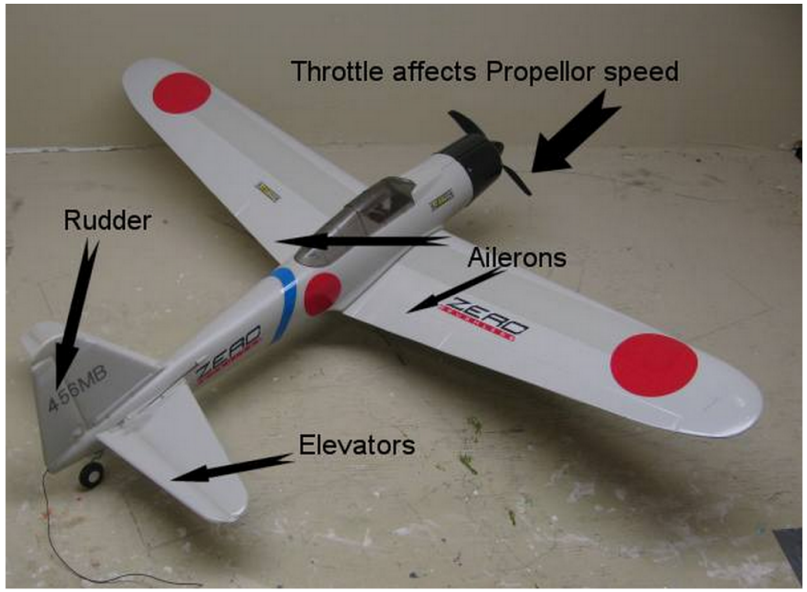
YOUTUBE -my RC airplane videos

This is a short tutorial with pictures that shows you the basics of how a Remote Control airplane works. I go over the theory of how the whole set up operates including a look at the actual mechanics of the airplane and the use of the hand-held controller. There are lots of different controls and controllers and they will vary but in this tutorial I take a look at a pretty standard set up and it will give you a good understanding of how RC airplanes work.

And here is a video I made showing this airplane coming out of the box and some short footage of me launching it off.

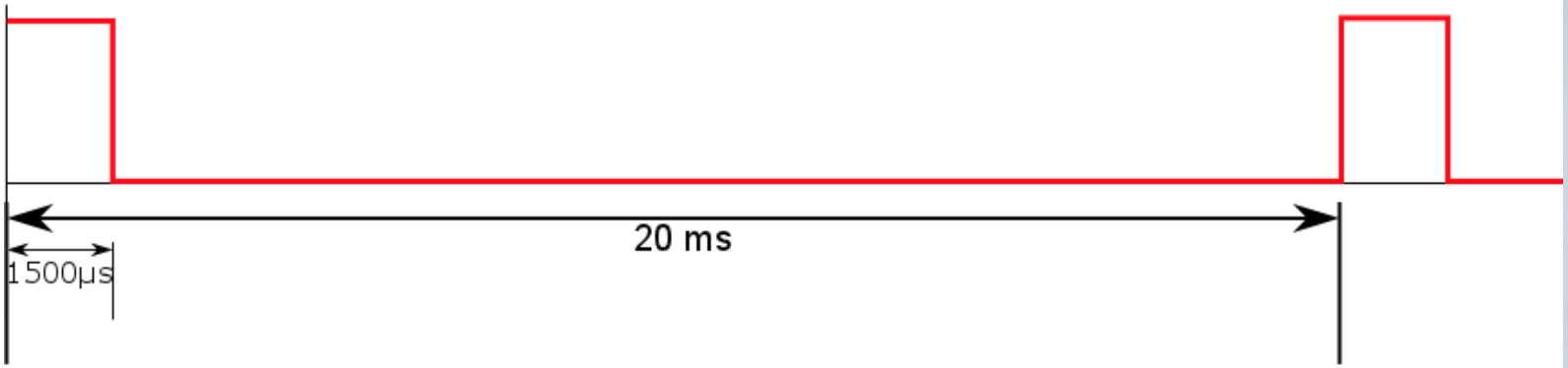
The controls on an RC airplane are pretty much the same as on a real airplane. This makes sense because you have the same thing (An airplane), it is just the size that is changed. There are four major controls in an RC airplane:

1. Throttle
2. Elevator
3. Ailerons
4. Rudder.



An explanation of the Controls

1. The Throttle: This affects the speed of the airplane. The more throttle you apply the faster the airplane will go. This also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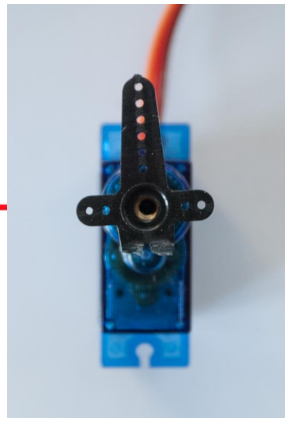

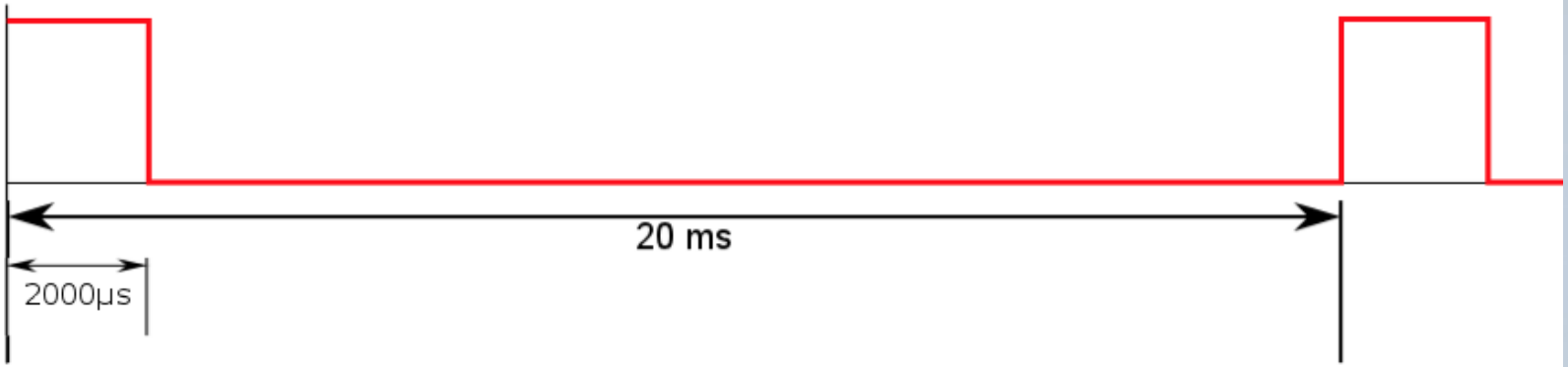
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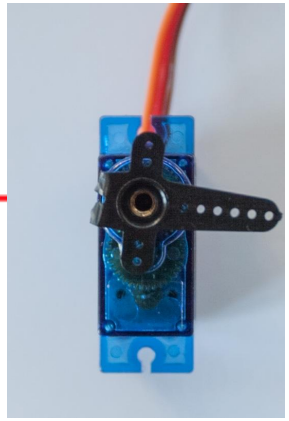

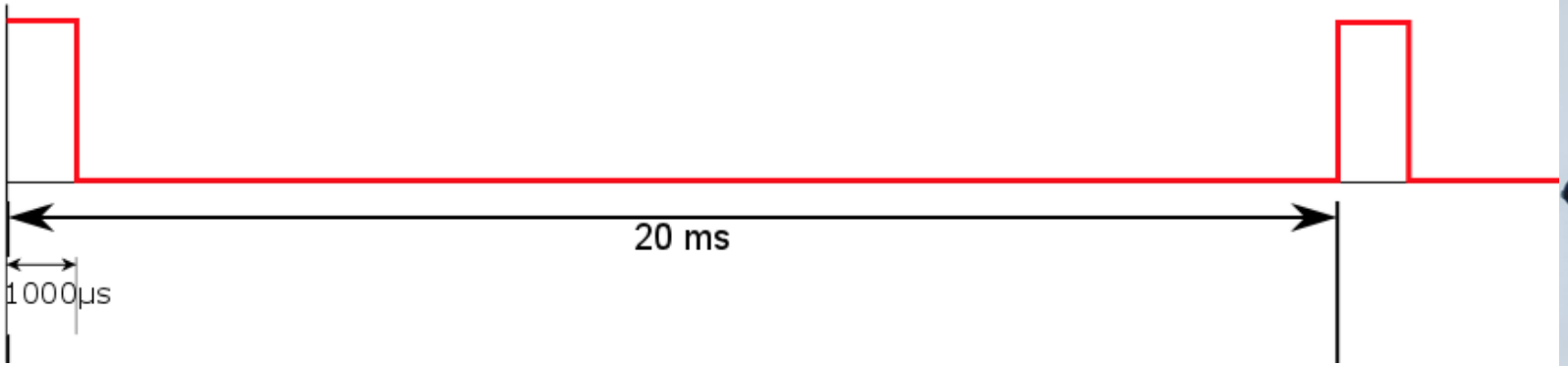
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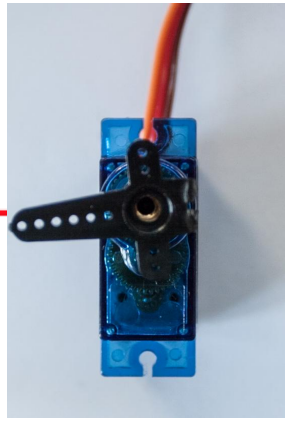


Receivers

Show http://orangerx.com/2014/01/25/r400-spektrumjr-dsm2-compatible-4ch-2-4ghz-receiver/ in browser

R400 Spektrum/JR DSM2

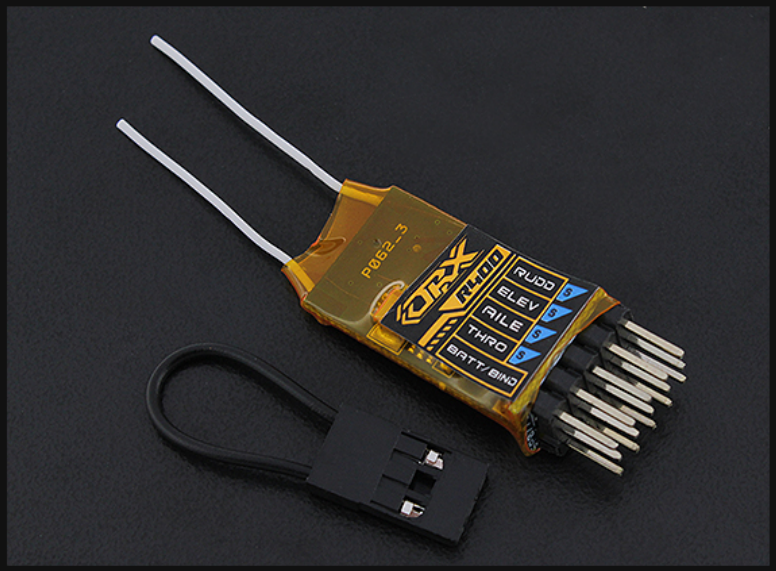
orangerx.com/2014/01/25/r400-spektrumjr-dsm2-compatible-4ch-2-4ghz-receiver/

Apps | MythWeb | lego mods | Flickr: Photos | Foto | Comics | Stuff | levelhead | AR | 3D scanner | makerbot | Geïmporteerd uit Sa | Beginning Embedde

Posted by *OrangeRX* on *January 25, 2014*

R400 Spektrum/JR DSM2 Compatible 4Ch 2.4Ghz Receiver

Posted in: Receivers. Tagged: 4-Channel, Air, DSM2, Parkflyer. Leave a comment



A perfect foamie or parkflyer receiver. Very small and very light!
The OrangeRx R400 now offers true signal reception diversity! This results in an even more robust signal link than the original R400, while providing the same quality, range and value. Taking it one step further, we've negotiated a lower component cost on these units so that we can offer you an even better price than before!

1) OrangeRx receivers are built using original components, MCU's and with state of the art SMT automation to ensure a quality product each and every time.
2) All OrangeRx receivers are QC tested before leaving the factory.
3) The OrangeRx will work with ANY Aircraft ORX/Spektrum/JR DSM2 2.4Ghz transmitter.
4) The OrangeRx R400 is only 2.7g in weight and 35x15x9mm in size.

Tip: Extension Wires

Improve signal strength and create a more robust link. Available at HobbyKing.com

Search

Follow

http://orangerx.com/2014/01/25/r400-spektrumjr-dsm2-compatible-4ch-2-4ghz-receiver/

Remote controls

Show http://www.open-tx.org/radios.html in browser

Radios Improving your Tx

The following radios and radio boards are compatible with OpenTX.

FrSky Taranis+

New version of Taranis with:
Haptic vibration
Multi colored LCD background light
Improved LCD display
Improved audio circuits

FrSky Taranis

ARM Cortex M3 32-bit 120MHz
212x64 LCD with gray scales
60 models + infinite on SD
9 flight modes
Telemetry
Advanced audio functions (voice files from SD, vario, ...)
SD data logger

Turnigy 9XR PRO

ARM Cortex M3 32-bit 36MHz
60 models + infinite on SD
9 flight modes
Telemetry Interface through Futaba trainer jack
Advanced audio functions (voice files from SD, vario, ...)
SD data logger

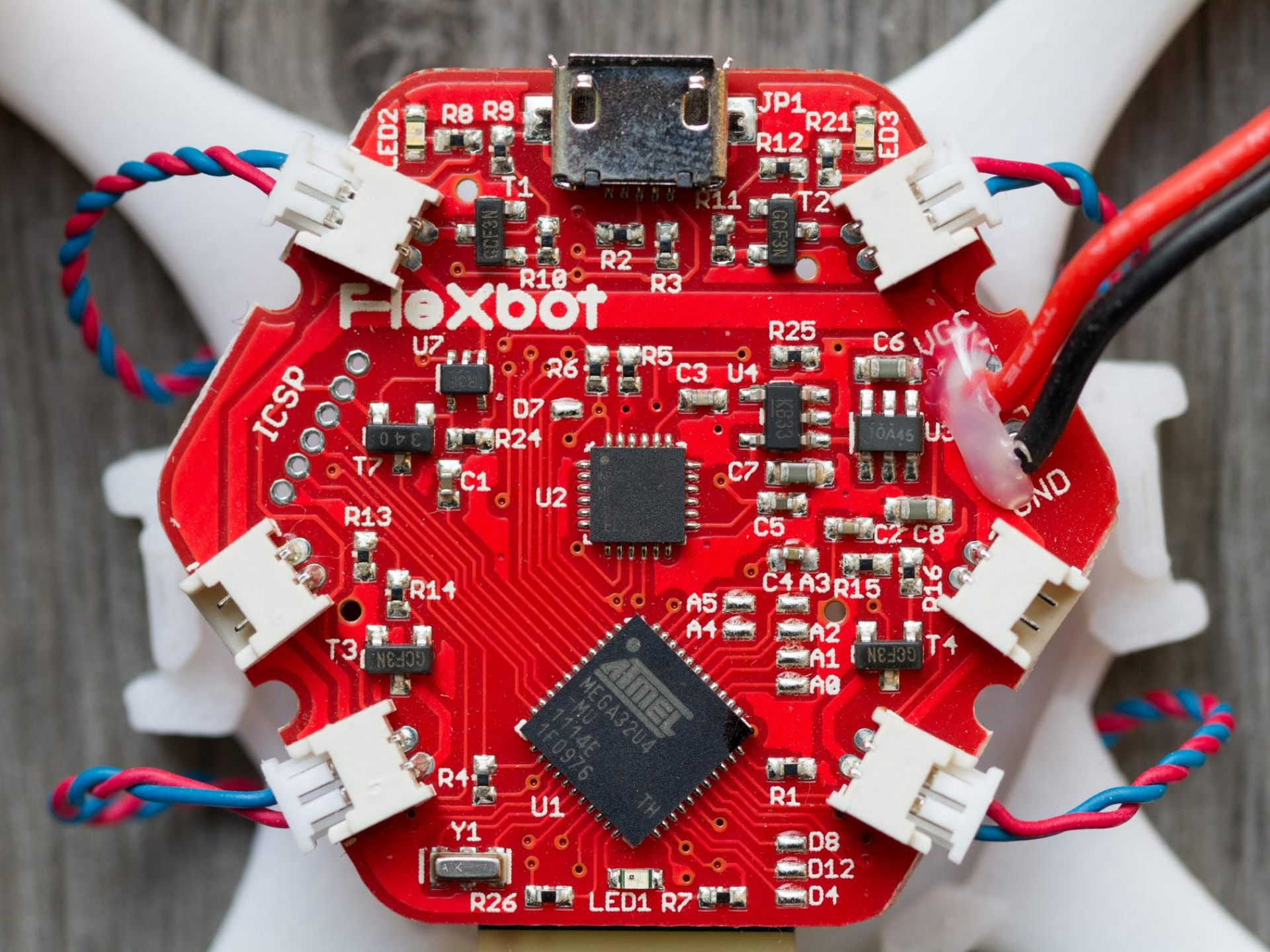
Turnigy 9XR

Telemetry

- Battery state
- Radio link state
- Raw sensor data
- Position
- Processed sensor data

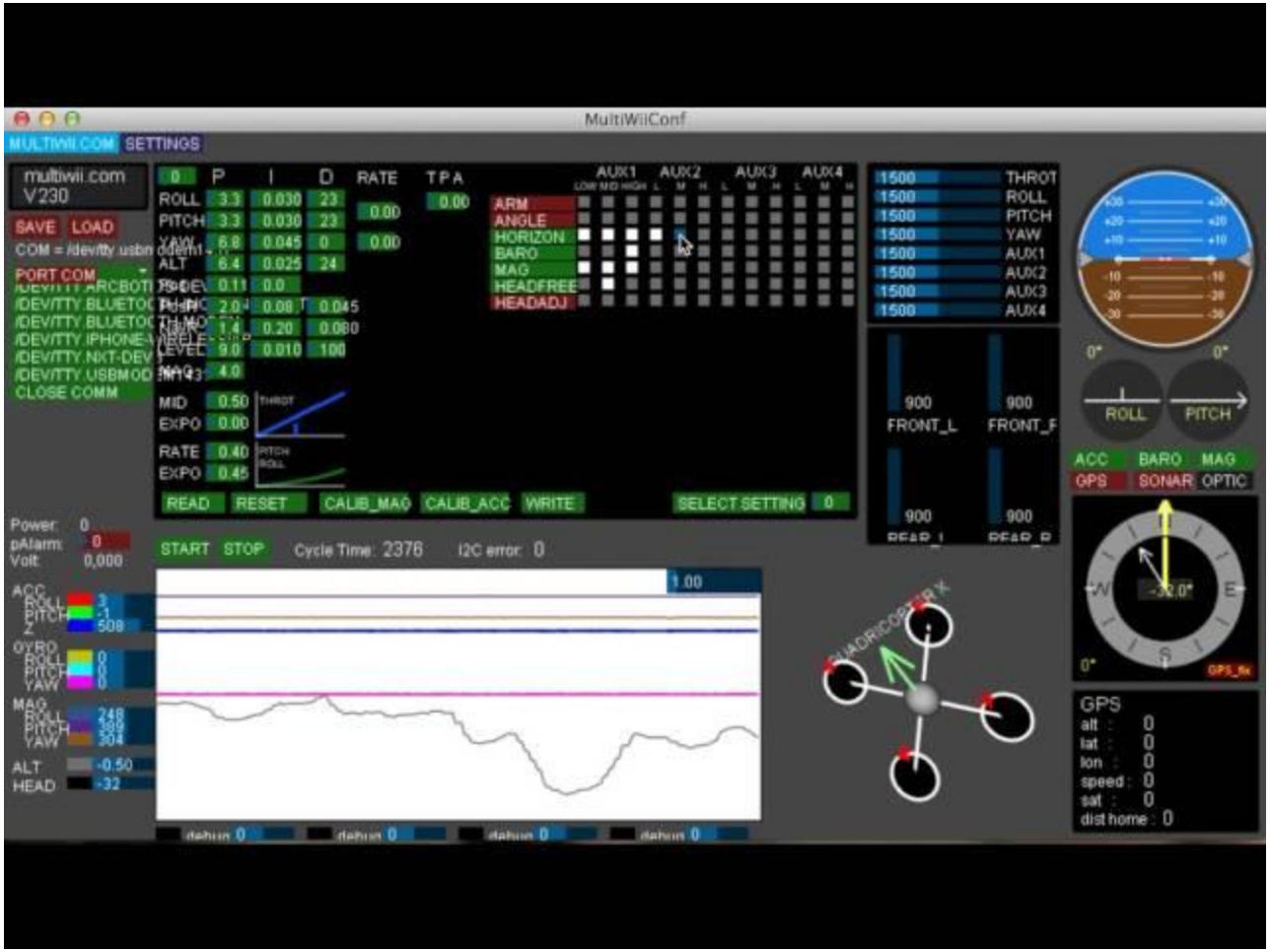
Atmega based flightcontrollers

- Needed for multirotors
- Have I²C, SPI and UARTs
- Different firmwares
  - multiwii
  - ardupilot
- ~50Hz control loop
- “multi core” solutions for GPS support



FlexBot
LED2
R8
R9
JP1
R21
LED3
R12
T1
R11
T2
R2
R10
R3
U7
R25
C6
VCC
R6
R5
C3
U4
ICSP
D7
R24
U3
T7
C1
C7
U2
GND
R13
C5
C2
C8
C4
A3
R15
R16
R14
A5
A4
A2
A1
A0
T3
T4
R4
R1
U1
Y1
D8
D12
D4
R26
LED1
R7

Config tools



Cortex-M based flightcontrollers

- 32 bit
- single precision floating point
- >40MHz clock speed
- More IO options
- ~400Hz control loop
- Multiple firmwares
  - baseflight (multiwii port)
  - taulabs
  - ardupilot

Hybrids

- Taulabs freedom
  - gumstix overo COM
  - cortex-M on baseboard
  - http://buildandcrash.blogspot.nl/2014/03/vertical-control.html
- Flexbot + Arietta G25
  - AT91 ARM9 on COM
  - AT32u4 on flighcontroller
  - didn’t make it to ELC-E :(

Hybrids

- Quadcopter at the Intel booth

Hybrids

- Linux and FC communicate over (USB) serial
- Mainly for telemetry logging
- Computer Vision

Running linux on the flightcontroller

- ‘hard’ realtime
- userspace drivers
- Only one real effort:
  - ardupilot

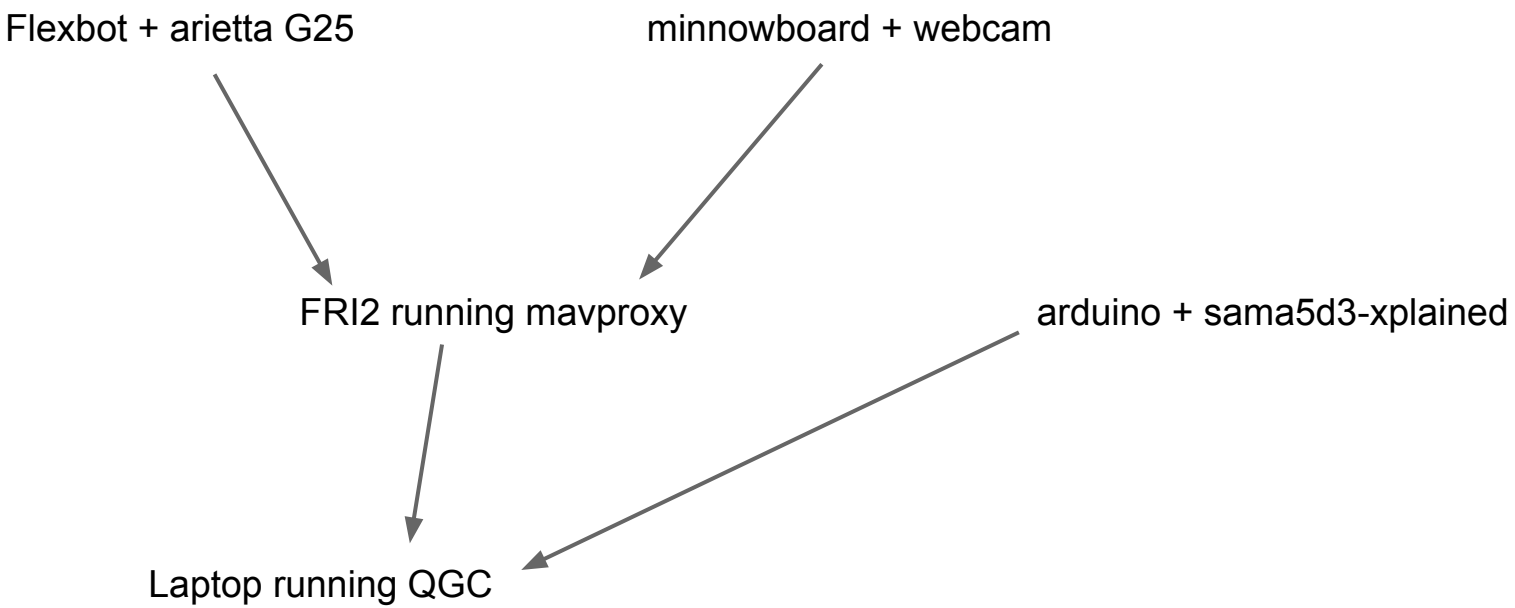
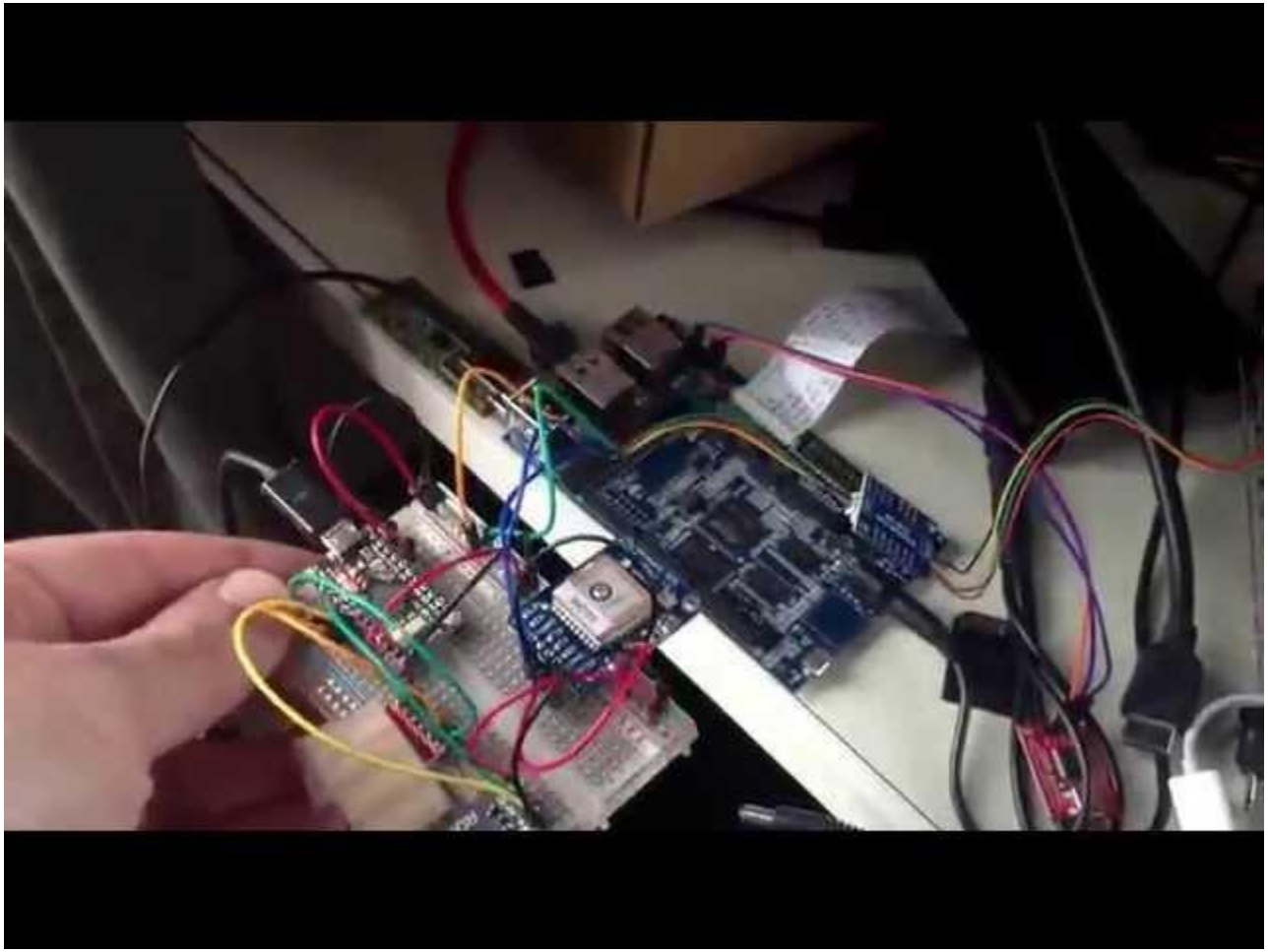
Groundstations

- qgroundcontrol (mavlink)
- taulabs ground (taulabs)
- Other, closed sourced ones

Middleware

- Mavconn
- Mavproxy

Mavlink example



QGC demo